REMARKS/ARGUMENTS

Claims 1-2, 5-10, 12-21 are currently pending in the present application. Claims 1, 9, and 17 have been amended. Claims 3-4, 11, and 22-30 and have been canceled. No new matter has been added in the amended claims. Reconsideration of the claims is respectfully requested.

Formal Matters

The Applicant thanks the Examiner for the helpful telephone interview conducted on May 5, 2005. During the interview, the pending claims and the McKnight reference were discussed. Claim language, including initiating application of a first paint voltage to one pixel element of the plurality of pixel elements while the liquid crystal material is transitioning was discussed. No agreement was reached during the interview.

Claim Rejections - 35 U.S.C. § 102

Claims 1, 2, 5-10, and 12-21 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,144,353 to McKnight.

As discussed with the Examiner during the telephone interview on May 5, 2005, the present invention discloses a method, in one embodiment, of reducing the amount of time required to "paint" pixels in a liquid crystal display. To reduce the amount of waiting time, embodiments of the present invention include applying an initial (transition) voltage to all pixels on the display. P. 6, lines 23-29. This initial voltage is maintained on each pixel, until the paint voltage for each pixel overwrites the initial voltage. P. 6, lines 30-32. For example, as illustrated in figure 2, first the transition voltage is applied to all the pixels inducing the liquid crystal material of all the pixels towards the bright state. Second, the actual value for each pixel is written into the pixels within the first millisecond.

As is shown in figure 2, if the last pixel in the display should be the bright state, the paint voltage and the transition voltage will be both approximately the same. Notably, as is illustrated in figure 2, because, the transition to the bright state for the last pixel began at about time 0 (in response to the transition voltage), the last pixel is in the bright state at about 3.5 milliseconds.

In contrast to figure 1A, in the example in figure 2, the response time of the display is reduced by about 22% ((4.5-3.5)/4.5 = 22%). This is a significant improvement in performance.

McKnight, on the other hand, discusses a display system in which a display is quickly driven dark and held dark for a period of time, represented by the time t_0 - t_1 in figure 2C. During the time t_0 - t_1, the pixel electrodes are painted with paint voltages, but the liquid crystal material does not transition and the display data is not visible. (McKnight at col. 10, lines 8-19). After the pixel data is loaded, at time t_1, the voltage on the control electrode is reduced so that the liquid crystal material begins to react to the paint voltage as illustrated by curve 154 in figure 2C of McKnight. (McKnight at col. 10, lines 19-26).

Claim 1 recites "wherein the single transition voltage is supplied to the one pixel element prior to initiating application of the first paint voltage." As we discussed during the interview, the method recited by claim 1 supplies the single transition voltage to the pixel element (inducing the liquid crystal material to begin the transition to the bright state) prior to initiating application of the paint voltage for the pixel element. Thus, in the claimed invention, the initiation of the painting process is performed after the beginning of the transition to the bright state. McKnight, on the other hand, applies the paint voltage (pixel data is loaded) during time t_0 - t_1 (curve 162 in figure 2D), prior to the liquid crystal material beginning to transition to the bright state (curve 163 in figure 2D).

Additionally, in the method recited by claim 1, initiating application of the first paint voltage overwrites the single transition voltage. This process of overwriting is a consequence of beginning the painting process after the beginning of the transition to the bright state. In McKnight, since the steps are performed in reverse order, with painting occurring prior to the transition to the bright state, initiating application of the paint voltage cannot overwrite a voltage that is not yet applied. For at least these reasons, claim 1 is in a condition for allowance.

Claims 2 and 5-8, which depend from claim 1, are in a condition for allowance, for at least the reasons discussed in relation to claim 1, as well as for the additional limitations they recite.

Claim 9 recites "wherein the application of the first paint voltage is not initiated until after the application of the first transition voltage." The method recited by claim 9 discloses an embodiment that does not load the pixel data for a pixel until after the transition to the bright state has begun. This method contrasts with McKnight, in which the pixel data is loaded while the display is held in a dark state (curve 162 in figure 2D), prior to the reduction of the voltage on the control electrode. For at least this reason, claim 9 is in a condition for allowance.

Claims 10 and 12-16, which depend from claim 9, are in a condition for allowance, for at least the reasons discussed in relation to claim 9, as well as for the additional limitations they recite.

Claim 17 recites "while the liquid crystal material in the pixel is transitioning to the bright state, a drive voltage comprising display data for the pixel is first supplied to the pixel to write display data for the pixel and overwrite the first voltage." In the embodiment disclosed by claim 17, the display data for the pixel is first supplied while the pixel is transitioning to the bright state. On the contrary, McKnight firsts supplies the display data during time period t_0 - t_1 while the display is dark. Subsequently, McKnight displays and views the previously loaded display data after time t_1 by reducing the voltage on the control electrode. Therefore, McKnight discusses a method of loading pixel data prior to the transition to the bright state, whereas the claimed method first supplies the display data while the pixel is transitioning to the bright state. For at least these reasons, claim 17 is in a condition for allowance.

Claims 18-21, which depend from claim 17, are in a condition for allowance, for at least the reasons discussed in relation to claim 17, as well as for the additional limitations they recite.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at (650) 326-2400, extension 5518.

Respectfully submitted,

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